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HYBRIDIZATION BETWEEN A PEREGRINE FALCON AND A PRAIRIE FALCON IN THE WILD

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ABSTRACT.—Interspecific hybridization in the wild between members of the order Falconiformes have rarely been reported. A successful pairing between a male Peregrine Falcon and a female Prairie Falcon that produced two young occurred in 1985 in southern Saskatchewan. Although actual copulations were never seen, several food transfers between the Peregrine and Prairie Falcon were observed, both birds incubated the eggs and both actively defended the eyrie site. The two young, both males, looked distinctly different from Prairie Falcons and after molting had blue backs, heavy malar stripes and rufous napes, characteristics typical of captive produced hybrids between these two species.

Hibridación silvestre entre halcones de las especies *Falco peregrinus* y *Falco mexicanus*

EXTRACTO.—Informes sobre la hibridación silvestre entre miembros de la orden falconiforme, raramente han sido presentados. Un apareamiento entre un halcón macho de le especie *Falco peregrinus* y un halcón hembra de la especie *Falco mexicanus,* que produjo dos crías, ocurrió en 1985 en el sur de Saskatchewan. Aunque las copulaciones mismas no fueron vistas, varias transferencias de comida, entre esta pareja de halcones, han sido observadas. Ambas aves se ocuparon de la incubación de los huevos y de la activa defensa del nido. Las crías, ambos machos, tenían el aspecto distintivamente diferente al de los halcones de la especie *Falco mexicanus.* Después de la muda de plumas, tuvieron dorsos azules, marcadas listas faciales y nucas rojizas, que son típicas características de los híbridos que de estas dos especies se producen en cautividad.

[Traducción de Eudoxio Paredes-Ruiz]

Interspecific hybridization in birds occurs infrequently. Mayr (1963) estimates that perhaps one in 50 000 birds is a hybrid. Although individual occurrences of natural hybridization are rare, Mayr and Short (1970) have recorded hybrids from over 10% of North American birds (52 of 516 non-marine species). Hybridization is most common in groups that do not have elaborate or long term pair bonds such as grouse (Tetraonidae) and hummingbirds (Trochilidae). It also is most often reported in species that are abundant. Mayr and Short (1970) were unable to find accounts of North American hybrids of "rare" species, including the entire order Falconiformes. It is therefore with some interest that I report on a successful pairing between two species of large falcons. Both species are relatively rare and have an elaborate and prolonged courtship, and a strong cooperative pair bond throughout the breeding season.

OBSERVATIONS

In mid-April 1984, an adult male Peregrine Falcon (*Falco peregrinus*) was observed on the South Saskatchewan River in southern Saskatchewan at a breeding site regularly used by Prairie Falcons (*F. mexicanus*; G. Stuwe, pers. comm.). Although peregrines have not been documented breeding on this river system in Saskatchewan, they were reported further west in Alberta into the early 1970s (Cade and Fyfe 1970). On 25 April, the site was visited again by Gerhard Stuwe, Bob Rafuse and myself. We observed a male peregrine flying with a female Prairie Falcon. Little or no aggression was seen and our impression was that the two birds were paired. These falcons occupied a territory that contained a potential nesting site (a hole dug in a cliff face) that was within two kilometers of three active Prairie Falcon eyries where females were incubating. In June 1984, when the area was visited again to band young, neither bird was present.

A number of visits to the area were made in 1985. On 19 April, an adult male peregrine was perched on a fence post eating a Common Snipe (*Capella gallinago*) near a nest site used by Prairie Falcons in 1984. The peregrine "cakked" aggressively when approached and flew off. When the site was approached several minutes later from the base of the cliff, both the peregrine and a female Prairie Falcon

were perched about 50 meters from each other on the cliff face. The Prairie Falcon flew toward the peregrine which responded by bowing and "eechipping." The Prairie Falcon displaced the peregrine from his perch and both flew together, perching again within two meters of each other with additional bowing and "eechipping" by the peregrine. The Prairie Falcon bowed and appeared to be soliciting copulation, although no copulations were ever observed.

The cliff face occupied by these two falcons in 1985 was near the center of a cluster of five potential eyries, as opposed to 1984, when they occupied a peripheral site. Two other Prairie Falcons were seen for a short time soon after our arrival on 19 April. Following the interaction between the peregrine and Prairie Falcon described above, the peregrine made a fast, direct flight to the west and engaged in a short combat with a male Prairie Falcon. The peregrine dominated the interaction, drove off the Prairie Falcon and returned to the cliff.

The site was next visited by Gerhard Stuwe and myself on the afternoon of 8 May. A male peregrine appeared to be incubating in a pothole in the same cliff where the birds were seen on 19 April. A female Prairie Falcon flew past the eyrie "cakking" and then flew to a fence post near the top of the cliff. During the next few hours, the Prairie Falcon flew out twice to chase other Prairie Falcons away from the eyrie at distances of 1 km or more. Both times on her return she flew past the eyrie "cakking." The second time, the peregrine flew from the eyrie and displaced her from her perch. The Prairie Falcon flew directly to the eyrie and made movements typical of a falcon settling on eggs. The peregrine made two flights to the west in the next fifteen minutes "eechipping" and chasing another Prairie Falcon.

Continuous observations were made on 16 and 17 May from a camp about 200 m west of the eyrie, and the events were recorded on film. The peregrine and Prairie Falcon alternated incubation duties and made several food transfers. The peregrine wore a U.S. Fish and Wildlife Service band on its left leg. On 31 May the Prairie Falcon was feeding small young in the eyrie and another food transfer occurred.

On 5 June the male peregrine was trapped at the eyrie. This Peregrine Falcon (*F. p. anatum,* band number 686-04921) hatched in 1980 at the Canadian Wildlife Service breeding facility at Wainwright, Alberta and was released in the same year from an artificial site located about 75 km east of the present eyrie. We removed two large downy young and three addled eggs from the eyrie and replaced them with three young, captive-bred peregrines between two and three weeks old. Both adult falcons defended the eyrie during the transfer. The site was visited again on 9, 18, and 19 June and 7 July. Both falcons were in attendance on all visits and their three foster young fledged successfully.

The two young which had been taken from the eyrie were both males. They were darker, heavier, and had larger toes than typical Prairie Falcons. Both were given to falconers and raised as imprints. After their first molt the falcons' backs were blue, their breasts more spotted than barred, their napes a rich chestnut color and their malar stripes were wide. The one in my possession weighed 680 grams (range for Prairie Falcon males is 420–639 g; Clark and Wheeler 1987) and was easily distinguished from either parental species.

In both 1986 and 1987, the same male peregrine, identified by the band and a missing secondary feather on one wing that was permanently injured during the trapping of the bird in 1985, was paired with a female Prairie Falcon at the same site. The five young that were produced in 1986 and the three young in 1987 were removed from the eyrie by directive from the Saskatchewan Department of Parks and Renewable Resources. None of these birds exhibited any characteristics that would suggest they were hybrids. All of them appeared to be "pure" Prairie Falcons. In March 1988 the adult male peregrine and a female Prairie Falcon were seen at the same eyrie, but they did not breed. In 1989 and 1990, the peregrine had moved to a site about 1 km east of the previous eyrie that also contained a man-made hole dug in a cliff face. He was in the company of a female Prairie Falcon. No evidence of attempted nesting occurred in either of these years. On 25 April 1990, Stan Rowe, Patrick Thompson and I visited the site and released a falconry-trained 2-year-old female peregrine. The released female flew to the top of the cliff and began food begging and the male peregrine responded with vigorous courtship flights, hitched wing displays and much "eechipping." He also flew to the nest ledge and began bowing and "eechipping." The female Prairie Falcon ignored both birds and drifted off to the east.

DISCUSSION

Hybridization among members of the genus *Falco* in captivity is easily accomplished by means of ar-

tificial insemination (Boyd 1978) and many Peregrine/Prairie Falcon hybrids have been produced in captivity (Bunnell 1986). To my knowledge, however, the only instance of an interspecific pairing between falcons that has resulted in actual copulation and the production of young in captivity was between a Saker (*F. cherrug*) and Peregrine Falcon (Morris and Stevens 1971). This may only reflect the relative rarity of interspecific pairs set up in captivity rather than an actual blockage to interspecific pairing. Suchetet (1896) describes several early records of potential crosses between different species of falcons. Because of uncertainty in the species status or lack of documentation regarding the success of the pairings, only the cross between a European Kestrel (*F. tinnunculus*) and a Merlin (*F. lithofalco,* now known as *F. columbarius*) which apparently resulted in four young, appears credible. A peregrine pairing with a Saker in the wild in the early 1970's in Bulgaria has been reported (Saar et al. 1984) but no young were found. Vern Seifert (pers. comm.) observed an incubating female Prairie Falcon in Colorado in 1949 with a tiercel peregrine being the only other falcon seen nearby. The site was not revisited to confirm this pairing. The only other recent case of hybrid young being produced by a natural mating of two species of falcons that I am aware of was in Utah in 1986, again a male peregrine and female Prairie Falcon at an artificial site (C.M. White, pers. comm.). The Prairie Falcon was trapped and removed and the eggs sent to the World Center for Birds of Prey in Boise where all five hatched. The male peregrine subsequently mated with a female peregrine and produced young later the same year.

In retrospect the potential for occasional pairing of peregrines and Prairie Falcons might have been predicted. The peregrine overlaps the entire range of the Prairie Falcon, often nesting in close proximity (Salt and Wilk 1966, Porter and White 1973) or even in the same eyrie in alternate years (W. Spofford, pers. comm.). They are essentially the same size with extremely similar courtship behavior and vocalizations. A recent study of the karyotype of these two species showed them to be indistinguishable at current levels of discrimination and suggests they may be more closely related then previously thought (Schmutz and Oliphant 1987).

An additional factor that may have facilitated the formation of the interspecific pairing in Saskatchewan was the fact that three eyass Gyrfalcons (*F. rusticolus*) and a female Prairie Falcon were released in the same vicinity as the peregrines in 1980 (Oliphant and Thompson 1988). Although never in contact with the other species until after fledging, the young peregrines often interacted with the Gyrfalcons and the Prairie Falcons as well as wild Prairie Falcons in the area. The absence of aggressive parents, which under normal circumstances probably would have driven away these other large falcons, may have encouraged acceptance of members of the other falcon species even though sexual imprinting on another species, as we currently understand it in falcons, should not have occurred at such a late stage in development.

Wild Prairie Falcons have sometimes been used to cross-foster captive-bred peregrines in reintroduction efforts. Over 60 peregrines have been fostered by Prairie Falcons during the past decade in the Rocky Mountains, California and southern Alberta. Gyrfalcons have also been used as surrogate parents for peregrines in the Yukon. At least some of these cross-fostered peregrines have mated successfully with their own species (B. Walton, pers. comm.). Although the biological significance of the infrequent occurrence of hybridization is probably minimal (Cade 1983), the potential for some gene flow between these two species of falcons in the wild has been demonstrated and should be taken into consideration in any management scheme. Documentation of the fertility of hybrid falcons, (which appears to be low in many crosses) and their ability to form viable pairs in the wild would be needed to assess the potential for gene flow.

With respect to the occurrences from 1986 to 1990, I can only offer conjecture. My interpretation of the events is that in 1986 and 1987, the same female Prairie Falcon returned to the site, successfully paired with a male Prairie Falcon and laid a clutch of eggs prior to the peregrine returning. The nesting dates in 1986 and 1987 were about 2 weeks advanced over that in 1985, which I suspect was the first year this female laid eggs. Although never observed, the peregrine upon arrival presumably drove the male Prairie Falcon from the site and successfully took over male duties. I attribute the unsuccessful breeding attempts in 1988 to 1990 to be due to the death of the original female and unsuccessful attempts of the male peregrine to form a strong enough pair bond to result in egg laying with a new female.

If this interpretation is correct, a number of interesting conclusions may be drawn. First, although the male peregrine was obviously capable of suc-

cessful breeding and could provide adequately for as many as five young, by age nine he had only produced two hybrid young. Second, it would appear that although a successful pair bond was established with one female Prairie Falcon, other females of that species were not so inclined. Finally, although circumstantial evidence suggests that the male peregrine was capable of displacing male Prairie Falcon(s) from its/their established territory (1986 and 1987), he either could not or did not try to take over at closely adjacent sites where Prairie Falcons successfully nested each year. Taken in total, it strongly suggests a relative decrease in breeding potential across species lines, a not too surprising conclusion.

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